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Employee Perceived Effect of Leadership Training: Comparing Public and Private Organizations

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ABSTRACT

This study reports on the effectiveness of a year-long field experiment involving training in transformational and transactional leadership in the public and private sectors. Using before and after training assessments by employees of several hundred Danish leaders, the analysis shows that transformational leadership training is associated with increases in behaviors linked to both transformational leadership and the use of verbal rewards, but only for public sector organizations. There is no impact in private sector organizations. Transactional leadership training appears to be equally effective in stimulating the use of pecuniary rewards in both public and private organizations.

Keywords: Leadership, Experiments, Sector Differences, Transformational Leadership, Transactional Leadership

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INTRODUCTION

Leadership is considered an essential element in the success of organizations whether in the public (Rourke 1984; Van Wart 2013) or private sector (Barnard 1938; Meindl and Ehrlich 1987; Antonakis and House 2014). Among leadership's crucial functions is the need to entice organizational employees to modify their personal goals and accept the goals of the organization when these are not aligned. Leaders seek to create a balance between the inducements the organization provides and the contributions it receives from its employees (Barnard 1938; Simon 1947). Inducements can take a variety of forms: utilitarian incentives, normative appeals (e.g. task significance and social impact), solidary benefits from association, and even coercion in some organizations (Clark and Wilson 1961; Etzioni 1965; Knoke 1988; Grant 2007, 2008; Bellé

2014; Stritch and Christensen 2014). The combinations of incentives play a major role for leadership behavior with different strategies stressing different types of incentives to gain employee contributions.

A large body of leadership literature investigates different types of leadership behaviors meant to motivate employees and increase goal attainment. Among the most researched leadership strategies in the generic leadership literature (Judge and Piccolo, 2004; Dinh et al. 2014), as well as in public administration research (Vogel and Masal 2015), is transformational leadership. Transformational leadership, together with transactional leadership, is the active component of what is referred to as the “full-range leadership theory.” Transformational and transactional leadership strategies stress somewhat different incentives. Transactional leadership relies on more utilitarian inducements (rewards and sanctions), while transformational leadership uses more normative appeals by creating a shared vision for the organization (Bass 1985; 1990; Burns 1978; Rainey 2014). Both types of leadership behavior have been linked to employee well-being and better performance in multiple studies (Lowe, Kroeck and Sivasubramaniam 1996).¹ We seek to determine if leadership behavior can be learned through training (Van Wart 2013, 533; Avolio et al. 2009) and whether leadership training will have an equally strong effect on leadership behaviors (as perceived by the employees) in publicly and privately owned organizations.

In the extensive scholarly literature on leadership as well as leadership training, the distinction between public and private organizations is rarely made. Both the literature and a large practical industry devoted to leadership training appears to assume that leadership training and the benefits of leadership training are not sector specific. Yet skepticism about this universal claim is merited. Public and private managers often have substantial differences in the incentives

they can use (Downs 1967; Wittmer 1991), and government employees have distinctly different values compared to business employees (Donahue and Zeckhauser 2011; Lewis and Ng 2013; Van der Wal et al. 2008). This article seeks to determine if exposure to leadership training – both transformational, transactional and a combination thereof – will have equally positive effects in public and private organizations by examining a randomized field experiment in Denmark. Given that both types of organizations invest numerous resources on leadership training, the effectiveness of leadership training on improving leadership behaviors in public and private organizations is an important management and research question (Seidle et al. 2016).

The goal of this article is to assess whether experimentally induced leadership training would increase the use of leadership behaviors by leaders (as observed by their employees) and how the effectiveness of leadership training differs between public and private organizations. We focus on leadership behaviors as observed by the leader's employees because the leadership literature highlights the importance of distinguishing between a leader's self-reports and employees' reports about a leader's behavior (Fleenor et al. 2010). There are at least two arguments for measuring the effects of leadership training as perceived by leader's employees: First, leaders tend to overrate their use of socially desirable leadership strategies (Podsakoff and Organ 1986). Second, leadership behavior has to be perceived by the employees in order to affect employee behavior and performance (Jacobsen and Andersen 2015).

The analysis begins with a discussion of transformational and transactional leadership, followed by the theoretical reasons why managers in different sectors might be more willing to adopt one type of leadership behavior or another. We then introduce our field experiment involving 506 randomly assigned managers in both the public and private sectors followed by a discussion of the reliability and validity of the measures we use. Before and after randomly

assigned leaders receive the training, we specifically ask followers to rate their leaders' leadership behaviors. Using a difference in differences analysis of the experimental results, transformational leadership training appears to change leader behavior only in the public sector; transformational leadership training is effective in improving leader behavior in the private sector only if it is combined with transactional leadership training. When transactional leadership training is used by itself (without any transformational leadership training), the effect of the training on employees' perception of their leader's behavior is the same in either sector.

LEADERSHIP

Leadership is one of social science's most-examined phenomena (Day and Antonakis 2012). The scientific study of leadership dates back to the turn of the 20th century with the "great man" or trait-based perspective. This early leadership research focused on individual traits including skills, demographic characteristics, and personality features (Judge et al. 2002; Derue et al. 2011) that were commonly found among effective leaders. This trait-based perspective was later criticized by scholars who paid attention to leaders' behaviors rather than their traits (Jenkins 1947; Derue et al. 2011). The literature on transformational and transactional leadership is part of this behavioral perspective (Derue et al. 2011). The work of Bass (e.g. Bass 1985; Bass and Avolio 1994) promoted transformational leadership and reignited the interest in leadership in general at a time where leadership research was beginning to lack theoretical advances (Day and Antonakis 2012).

Although the ideas underlying transformational leadership have a long history that dates back to the work of Barnard (1938) and the 1920s Hawthorne experiments (Roethlisberger and Dickson 1939), work by Bass (1985) and others defined the elements of transformational

leadership to contrast with what was perceived as the more common form of transactional leadership. Transactional leaders motivate their employees by recognizing the array of values and needs of their employees and providing incentives that link to these needs and values in exchange for performing the tasks that the organization needs (see Rainey 2014). Although transactional leadership can be caricatured as focused solely on monetary incentives, that view is incorrect since the transactions might well include verbal rewards, creation of enlarged, more interesting jobs and other non-pecuniary elements.

Transformational leadership's distinguishing characteristic is the effort to build a shared organizational vision, often linked to higher level goals that might benefit the community or the polity. The logic of this approach is rooted in motivation theories that suggest that monetary incentives and individual level incentives have limits as motivational tools (Herzberg 1966; Maslow 1943). The basic concept is that leaders will transform employees and motivate them to achieve higher order needs by working toward organizational goals.

Although generally presented as contrasts, transformational leadership and transactional leadership have substantial overlap. Both approaches stress the need for leaders to enunciate clear goals (often challenging but achievable goals, Latham and Locke 1991), provide constructive feedback to employees, and build an environment of trust by making credible commitments to employees in exchange for better performance (Favero et al. 2015). Bass (1990) clearly incorporates elements of transactional leadership in his discussions of transformational leadership, and his work might be interpreted as advocating transformational leadership as a method of augmenting transactional leadership. The augmentation effect (Bass 1985) thus stipulates that transformational leadership adds to the effect of transactional leadership; although this augmentation is often discussed, it is little tested (Judge and Piccolo 2004). This overlap in

the practice of transformational and transaction leaders has implications for the study of leadership. Studies thus need to analyze what both types of leadership behavior have in common as well as the differences between the two approaches.

LEADERSHIP IN PUBLIC AND PRIVATE ORGANIZATIONS

Theoretical work on transformational and transactional leadership generally does not recognize the distinction between public and private organizations. In part this reflects the general nature of leadership theory, but it also reflects both practice and academic scholarship. The theory is general enough to apply to any organization where either incentives are used to gain employee contributions or a vision for an organization can be constructed. Those criteria apply to both public and private organizations. Although there are several studies that examine leadership differences in public and private organizations (Lowe et al. 1996), the leadership training literature tends to focus on either public or private organizations (Seidle et al. 2016; Dvir et al. 2002; Kelloway, Barling, and Helleur 2000). Only one experimental study examines whether transformational leadership training is equally effective in both sectors. Parry and Sinha (2005) conclude that there is no difference in the efficacy of transformational training in public or private organizations. Their small sample of leaders ($n = 50$) and thus the lack of discriminating power of the statistical tests, however, suggest that this Australian study is not the last word on the topic.

THEORETICAL EXPECTATIONS FOR SECTOR DIFFERENCES

Leadership training does not operate on a tabula rasa but rather takes managers, often with extensive experience, and subjects them to training. In part, leadership training seeks to

overcome some prior predispositions of managers and reinforce others. At least two theoretical reasons suggest that transformational and transactional leadership training might be more effective in one sector rather than the other – there is substantial selection bias by individuals and organizations in terms of who is hired in public versus private organizations *and* the managerial instruments available to leaders generally differ, often substantially, between the two sectors. Together these differences suggest that transactional leadership might hold greater appeal in the private sector where monetary incentives are greater, and transformational leadership might be more attractive in the public sector where its normative orientation better fits public employees. Tracing out these arguments will generate two testable hypotheses.

Sector Differences in Employees

Labor markets are hardly random; both employees and employers have preferences that each seeks to maximize in the hiring process. Employees have perceptions of what the ideal job might be or the job that their education and training best prepares them to undertake. For employers, selection bias is the *sine qua non* of human resources policy as the organization seeks individuals who will fit with the organization and can be transformed into productive assets. Substantial evidence indicates that these dual preferences generate differences between public and private employees and managers that relate directly to leadership behaviors. Public employees are more likely than private employees to have higher levels of public service motivation, a psychological construct that links to desire for public service, an interest in helping others, and altruism (Vandenabeele 2008). Similarly, government programs tend to appeal to the normative values held by some individuals; as an example environmental protection advocates are more likely to work for a government agency charged with protecting the environment than a

private business, all things being equal. Studies in a wide variety of countries have shown public employees to be distinct from private sector employees in terms of being less affected by extrinsic motivation (Buelens and Van den Broeck 2007), with higher public service motivation (Bullock, Stritch, and Rainey 2015), and lower concerns about high income levels (Bullock, Stritch, and Rainey 2015). The public versus private value differences suggests that transformational leadership will be more likely to be adopted in the public sector and that transactional leadership will be more frequent in the private sector.

Sector Differences in Managerial Tools

Public sector managers are also more limited than private sector managers in the managerial actions that they can take to manage people and programs. Pay systems and collective labor agreements are for example less flexible (Bach and Bordogna 2013; Hansen and Mailand 2013). Atwater and Wright (2007) find that public managers have less control over rewards for employees than private sector managers, and that public leaders were more likely to be perceived as inspirational by employees (Andersen 2010). Hansen and Villadsen (2010) attribute differences in public and private sector management to the different organizational contexts which generate greater participative leadership in the public sector. Wright (2007) finds a positive correlation between public service motivation and the use of transformational leadership in the public sector (see also Wright, Moynihan and Pandey 2012). In an extensive meta-analysis, Lowe, Kroeck, and Sivasubramaniam (1996) conclude that transformational leadership is more common in the public sector. In a meta-analytic test of the relative validity of transformational and transactional leadership, Judge and Piccolo (2004) find that the validity of transformational leadership appears to generalize across their four study settings (business,

college, military and public sector), but contingent reward (that is, transactional leadership) worked best in business settings. They attribute this finding to the resource-dependent nature of the contingent reward leadership and that business leaders do not have the same limitations as in the public sector in terms of rewarding employees in exchange for effort.

Because the tools of public managers are more limited than those of private sector managers, they need to rely more on normative appeals and creating a vision for the organization than on monetary incentives. These normative means include, but are not limited to, paying attention to the social impact of the task (an employee's feeling that they benefit others and society) and emphasizing job significance (Bellé 2014; Grant 2007, 2008; Stritch and Christensen 2014; Van Loon et al. 2016). Public managers frequently cannot reward employees with higher salaries and face greater limits in disciplining or terminating employees. The relative managerial constraints on public and private managers thus suggests that public managers are relatively more likely to use transformational leadership and private sector managers are relatively more likely to use transactional leadership.

Sector Specific Hypotheses

Given the institutional environment of public organizations, public sector leaders will be more receptive to and more likely to internalize the information in the transformational leadership training and make the behavioral changes associated with that form of leadership. Specifically, because public employees are motivated more by intrinsic values than by extrinsic rewards and because public managers have fewer material rewards to provide, we predict:

H1: The effect of transformational leadership training on managers' transformational leadership behavior will be larger in public organizations compared to private organizations.

The institutional environment of private organizations, in contrast, will motivate private sector leaders to be more receptive to and more likely to internalize the information in the transactional leadership training and make the behavioral changes associated with that form of leadership. Specifically, because private sector employees will be more motivated by material rewards and private sector managers have more material rewards to provide, we predict:

H2: The effect of transactional leadership training on managers' transactional leadership behavior

will be larger in private organizations compared to public organizations.

Because both transformational leadership and transactional leadership are well-known approaches and because our experiment involves experienced managers, it is possible that managers could have well developed leadership strategies before any of the training. This suggests that if leaders have established their leadership behavior before the training, leadership training will have a reduced impact on improving leadership; positive training effects will start diminish depending on the prior level of existing transformational or transactional behaviors.

H3: The influence of leadership training will be subject to diminishing returns, that is, managers who extensively use transformational leadership techniques are unlikely to gain as much from additional training as those who did not use these techniques (with a similar logic in terms of transactional leadership).

If the diminishing returns hypothesis holds, it is possible that this might differ according to sector since we expect that managers in the private sector will have had more opportunities to use transactional leadership actions than those in the public sector. If this is the case, we can extend the test for diminishing returns and determine if the diminishing returns also varies by sector.

METHODS

To examine the role of leadership training in public and private organizations, several methodological challenges need to be addressed. First, the literature clearly demonstrates that organizational context and mission are related to the ability to use transformational leadership (Wright 2007; Wright, Moynihan, and Pandey 2012). Transformational leadership is clearly easier to use when the organization's mission is important and meaningful. This indicates that the public and private managers examined should manage organizations that have similar or even identical functions. To control for mission and function, sets of public and private organizations were matched with similar functions. A total of 506 managers from public and private primary and lower secondary schools, public and private day care centers, and private banks and public tax collection offices completed the experiment.² For schools and daycare centers, the functions performed are identical; the match between banks and tax collection offices brings similar skills and financial functions.

Second, all managers are likely to have at least the rudiments of a leadership behavior that results from their prior training and experiences. These types of behaviors are likely to overlap with transformational and transactional leadership as defined in the literature, but they are also equally likely to combine elements of these strategies with a variety of unrelated behaviors. Controlling for such pre-existing attitudes and behaviors calls for a design that both compares changes in leadership behavior between public and private organizations after the experimental intervention relative to a control group and includes the initial level of the relevant leadership behaviors.

Third, managers are quite likely to over-estimate their leadership behavior. In a study of

155 U.S. Navy surface fleet officers, Bass and Yammarino (1991) found that the self-ratings of leadership behavior tended to be inflated in comparison to subordinates' ratings. The self-other rating agreement literature emphasizes that the use of self-ratings of leadership is problematic (Fleenor et al. 2010), which has led to a tradition of using others' ratings of leadership (see for example Trottier et al. 2008 and Wright et al. 2012) as a more accurate way to measure leadership (Antonakis and House 2014; Podsakoff and Organ 1986). Furthermore, either through prior education and training or through outside reading, managers should be well aware of transformational and transactional leadership. The generally positive literature on these topics implies that social desirability could play a role in leaders' responses to questions about their behavior. Thus, to avoid this problem, and measure leadership more accurately, we opted to measure leadership behavior by asking the leaders' employees about the leaders' behavior. The validity of using employee assessments of leadership behavior has been demonstrated both by field studies of public management (Favero et al. 2015; Jacobsen and Andersen 2015) and in experimental studies (Dvir et al. 2002; Kelloway, Barling, and Helleur 2000).

The Organizations

Leaders from six different types of organizations are included in this study – public primary and lower secondary schools, private primary and lower secondary schools, public daycare centers, private daycare centers, public tax offices, and private bank offices. The selection of the organizations was designed to provide a range of functions and missions from social welfare (schools and daycare) to finance (tax and banks). Because mission is frequently linked to leadership, being able to compare public and private organizations engaging in similar functions (schools, daycare and finance) enhances comparability across sectors.

This study uses the ownership definition of public and private organizations. Existing classifications of publicness also include the degree of government funding, the extent of government regulation, or whether the organization serves a public purpose (Bozeman 1987). Using broader definitions of publicness, the groups of organizations all have some characteristics of public organizations. The private primary schools are funded by government at 75% of the rate of public schools and collect additional fees from parents (Danish Ministry for Children, Education and Gender Equality 2015a). Both public and private daycare centers are funded through a combination of public funds and user fees (Danish Ministry for Children, Education and Gender Equality 2015b). In terms of regulation, even the most private of the organizations, banks, are subject to substantial government regulation (for an overview, see Stabilitet 2015).

Despite the mixing of public and private funds and the regulation of all the organizations, the publicly owned organizations are distinct from the privately owned organizations in both the degree of direct government control and in the restrictions on managerial actions in terms of personnel management. All the publicly owned organizations are part of a government structure that provides some oversight, however indirect, of a body of elected officials (municipal government for day care and schools and the Danish parliament for tax). The publicly owned organizations are also more limited in hiring, compensating, and terminating employees than the privately owned organizations are. Defining public organizations as being publicly owned and private organizations as being privately owned may thus make our test more conservative, but sector differences are still plausible.

The Experiment

A total of 506 managers participated in the study; the managers were informed that this

Sectoral Differences in Leadership Training Effectiveness

was an experimental study and that they had a 75% chance of receiving one year of leadership training that was equivalent to an executive master course in Denmark. The leadership training included the elements recommended by leadership training literature (e.g. Seidle et al. 2013; McCall 2010; Day 2013) such as classroom education, coaching, feedback and training in applying leadership principles on the participants' own organizations. The managers were randomly assigned to three treatment groups – a transformational leadership training program, a transactional leadership program, a combined transformational and transactional leadership program -- and a control group. We used strata to ensure an even representation of leaders from all types of organizations in all the training programs and the control group. Based on the managers' geographical workplace location, the three experimental groups were each distributed into seven classes with 15-25 participants (resulting in a total of 21 classes). Four teachers (professors in economics, public administration and organizational behavior) were randomly assigned to classes with each class having all sessions taught by the same instructor. Each teacher taught classes from all programs. The two public administration teachers each taught two classes from all programs, the organizational behavior teacher taught the same although only one class from the transactional training program. The teacher from economics taught two transactional classes and one of each of the other training classes. The training effects do not differ systematically between the teachers (identifying reference omitted). The training modules consisted of four seven-hour classes over a period of one year based on a 600 page curriculum and course work between meetings. The leaders' employees were asked to evaluate the leadership behavior of their leader both before and after the experimental treatment. We limit our analysis to employees who rated their leader both before and after the training to control for any individual characteristics that could affect the ratings.

Our statistical comparisons will always be between employees of leaders who received a given type of training and employees of the control group (where the leaders received no training). One might argue that the treatment groups could serve as control groups or quasi-control groups for each other, that is, the transactional leadership group could be added to the control group when we analyze the effect of transformational leadership training and oppositely. In our study, we opt not to do so because transformational leadership and transactional leadership have some overlap both theoretically and empirically. Both try to make employees follow a set of clear goals; and verbal appreciation can be interpreted as conditional verbal rewards (a transactional logic) or as a transformational leader's effort to highlight how employees contribute to the desirable future depicted in the vision. These overlaps could potentially limit the distinctiveness of the control group and bias our results. The comparisons will also include only the experimental groups expressly targeted; that is, in terms of transformational leadership only the transformational leadership groups will be included in the analysis; the transactional leadership group will not be included because there is no hypothesis about how transactional training might affect transformational leadership.

The Dependent Variables

Until recently, the assessment of transformational and transactional leadership was widely conducted with the Multifactor Leadership Questionnaire (MLQ). Recent critical research, however, has raised major concerns about both the conceptualization and the associated measure, MLQ. The main points of critique are that the conceptualization confounds the definitions of the leadership strategies with their effects (Van Knippenberg and Sitkin 2013; Yukl 1999; Judge and Piccolo 2004) and that the dimensions of transformational and

transactional leadership are not exhaustively theorized (Van Knippenberg and Sitkin 2013). Consequently, we rely on the work by Jensen et al. (2016) which has reconceptualized transformational and transactional leadership and developed and tested measures, which are applicable to public and private organizations. Specifically, transformational leadership is behaviors that seek to develop, share, and sustain a vision, while transactional leadership is the use of contingent rewards and sanctions (Jensen et al. 2016).

Three dependent variables will be used in the analysis – a measure of transformational leadership, a measure of the use of verbal appreciation, and a measure of the use of pecuniary rewards. Transformational leadership was assessed with four Likert scale items that were included in questionnaires to the participating leaders' employees before and after the leadership training. The four questions asked about the leaders creating a clear vision for the future, getting employees to accept common goals, seeking to encourage employees to work together, and clarifying how employees can contribute to organization goals. The four items all loaded on a single factor with correlations between 0.86 and 0.90 with a Cronbach's alpha of 0.89 (see appendix table 1).

The use of the verbal appreciation by leaders of their employees' efforts and results can be considered an element of both transformational leadership and transactional leadership. Three Likert scale items measured the use of verbal appreciation based on using such rewards when employees live up to requirements, using the rewards based on employee performance, and letting employee effort determine rewards. The three items loaded strongly on a single factor with correlations between 0.92 and 0.95 with a Cronbach's alpha of 0.93.

The use of pecuniary or material rewards, a component of transactional leadership, was measured by three Likert scale items that linked material rewards to employees meeting

requirements, employee performance, and the leaders tying promises of pecuniary rewards to future performance. The three items correlated with a single factor between 0.84 and 0.92 with a Cronbach's alpha of 0.88.

Confirmatory factor analysis (see Jensen et al. 2016) shows both strong convergent validity of the measures and also discriminant validity between the measures. Measures of the same concept cluster closely with each other and are less correlated with the other measures. The analysis uses an additive scale of the three measures with the metric of the scale changed so that it ranges between 0 and 100. This transformation permits the comparison of scales with a different number of items. A total of 3,269 employees rated their managers in this study both before and after the training.³

FINDINGS

The experimental design provides three different treatment groups – transformational leadership training, transactional leadership training, and combined leadership training – all that should be compared to the control group that received no leadership training. Our strategy of analysis will be to present three regressions for each dependent variable (the changes in leaders' behaviors). The first will include just the experimental treatment effects, the second will control for whether or not the organizations are public, the third will interact the treatment effects by sector to determine if leadership training has a different impact in the public sector compared to the private sector and also control for absences from the training sessions and potential diminishing returns by using the pre-treatment leadership value.⁴

Table 1 presents the results for transformational leadership training using the change in transformational leadership as the dependent variable.⁵ Both transformational leadership training

and combined leadership training are associated with a positive increase in employee perceived transformational leadership (Model 1). The relative impacts for the two are essentially the same magnitude. Model 2 shows that perceived changes in transformational leadership are greater in public organizations than in private organizations, a finding consistent with the contention that public sector employees would be more sensitive to transformational leadership training (hypothesis 1) and the training effects remain statistically significant.

[Table 1 about here]

Hypothesis 1 predicts that the impact of transformational leadership training will be larger in the public sector than in the private sector. The interaction effects in Model 3 are designed to determine if leadership training is more effective in one sector than another. The coefficient for the transformational leadership only training experiment now should be interpreted as the mean treatment effect in the private sector (-3.848), a negative albeit insignificant result. The public \times transformational coefficient (+7.937) indicates the difference in treatment effect between the public sector and the private sector, a statistically significant difference. The sum of the two coefficients ($-3.848 + 7.937 = 4.089$) is the average net gain in the public sector owing to the treatment which is also statistically significant. So while the overall impact of transformational leadership training is positive (Model 1), this results solely from the changes in the public sector (Model 3). Transformational leadership training by itself appears to be effective only in the public sector.

The impact of combined training (transformational and transactional) can be assessed in a similar way (a further test of hypothesis 1). The impact in the private sector (the Combined Leadership Training coefficient) is an increase of 2.275 points in perceived transformational leadership behavior (not statistically significant). Public sector employees perceive an additional

Sectoral Differences in Leadership Training Effectiveness

2.668 points change (relative to the private sector) which is also not a statistically significant difference; the net gain in leadership behavior in the public sector, the sum of these two coefficients ($2.275 + 2.668 = 4.943$) appears large in comparison to other significant findings but has a large standard error that overlaps zero. The conservative conclusion from these findings is that combined training is equally effective in both sectors.

Model 3 also includes both the pretraining value of transformational leadership behaviors and a measure of training absence. The negative coefficient for pretraining leadership clearly indicates that individuals who have already adopted a transformational leadership approach gain less from additional transformational leadership training than those who are not transformational leaders initially.⁶ This supports hypothesis 3 on diminishing. Although absences from the training session are negatively associated with changes in perceived leadership behaviors, the results are not statistically significant.

In summary the first experimental results demonstrate that transformational leadership training by itself in this case is effective in changing the leadership behavior of managers (in the eyes of their employees) in the public sector but not in the private sector. This supports hypothesis 1. A combination of leadership training that incorporates both transformational and transactional leadership appears to be equally effective (a significant relationship in model 1 and no differences in model 2), but the overall finding of a significant impact is being driven by the results in the public sector (again support hypothesis 1).

Verbal appreciation of employee effort and results can be seen as an element of both transformational and transactional leadership; both forms of training could be associated with changes in this type of leadership behavior. Table 2, which can test both hypothesis 1 and hypothesis 2, presents a set of results concerning verbal appreciation parallel to those in table 1

but including all three experimental groups since each could influence the use of verbal rewards. Model 1 shows positive effects for all three experimental training regimens although none of the coefficients for the experimental trainings is statistically significant. Model 2 indicates that public sector managers are more sensitive overall to the training in terms of verbal awards, but again the results do not attain conventional levels of significance.

[Table 2 about here]

The conclusion on lack of sector differences, however, would be premature. The top three coefficients in Model 3 shows the influence of the training regimens in the private sector; all are negative but not statistically significant. Leadership training has a differ impact in the public sector, producing three positive coefficients with the impact of transformational only leadership training being statistically different from that in the private sector. Unfortunately this positive difference in impact is not sufficient to increase the overall leadership behaviors; the net impact of transformational leadership training found by adding the two coefficients together ($-6.029 + 7.475 = 1.446$) is not statistically different from zero. Too much should not be read into these differences. Although the public sector impacts are positive and the private sector ones are negative, they do not add up to either a statistically or a substantively meaningful impact overall.

The use of pecuniary rewards for performance is a central element of transactional leadership but plays no role in transformational leadership. Table 3 presents the experimental results for transactional leadership training and combined training on the use of pecuniary rewards. Model 1 shows that transactional leadership training has a statistically significant effect on the use of pecuniary rewards, while the effect of combined leadership training in transformational and transactional leadership is positive, but not statistically significant. Model 2 shows a modest and statistically insignificant, higher tendency for public managers to increase

their use pecuniary rewards perhaps reflecting the more limited options in the public sector.

[Table 3 about here]

The interaction effects in Model 3 test for hypothesis 2 which predicts that transactional leadership training will be more effective in the private sector. When controlling for prior use of pecuniary rewards and absences from training, combined training generates a positive increase in the use of pecuniary rewards in the public sector that is clearly lacking in the private sector (the difference is modestly significant although the net impact in the public sector is not). For pure transactional leadership training in contrast, the training is equally effective in both the public and private sector. Neither finding supports hypothesis 2 that transactional leadership training will be more effective in the private sector. The absence of statistically significant results in the interactions results from the smaller number of respondents when divided by sector. The overall, but modest, result of the change is what indicates the effectiveness of transactional training on pecuniary rewards in model 1. Both absences and pretraining levels of pecuniary reward behavior are negatively associated with changes in leadership behavior on this dimension.

In the previous analysis we have controlled for pretraining leadership scores and in all three cases the results are consistent with hypothesis 3 (that training will have diminishing effects if leaders have higher levels of the leadership behavior before the training). Because we had expectations that transformational leadership would be more prominent in the public sector and transactional leadership would be more used in the private sector when we generated hypotheses 1 and 2, whether sector affects the diminishing returns of training is an interesting avenue for additional analysis. Logic might suggest that transformational leadership training will be subject to greater diminishing marginal returns in the public sector (meaning that the training effect will be dampened more by the higher level of initial transformational leadership in public

organizations) and that transactional leadership training will have greater diminishing marginal returns in the private sector (meaning that the training effect will similarly depend more on initial transactional leadership in private organizations). The previous tables merely showed that prior levels of leadership generated diminishing marginal returns. To test the sector specific impacts, we take the final models (model 3) from the first three tables and include an interaction of the public sector variable with the pretraining leadership scores in table 3. This interaction term will indicate if the diminishing marginal returns is more or less rapid by sector.

[Table 4 About Here]

Although the addition of a second set of interactions generates substantial collinearity, the analysis shows some clear results.⁷ In model 1 examining transformational leadership, the preexisting transformational leadership coefficient (-0.287) shows a significant negative effect (consistent with declining marginal returns), and this should be interpreted as the marginal returns estimate for the private sector. The interaction coefficient (-0.141) shows the difference between the public and the private sector; this significant and negative coefficient indicates that transformational leadership is subjected to greater diminishing marginal returns in the public sector, thus providing support for our contention (a total of $-0.287 + -0.141$ or -0.428). Figure 1a presents these diminishing returns graphically; note how the slope for public organizations is much steeper than that for private organizations.

[Figure 1 About Here]

The verbal appreciation results (model 2) show an overall diminishing marginal returns based on prior leadership levels, but there are no sector differences (see also Figure 1b). The pecuniary rewards equation (model 3) presents clear and consistent results in regard to sector differences. The pretraining leadership score is strongly negative indicating substantial

diminishing marginal returns in the private sector (-0.641). The public sector interaction coefficient is *positive* and significant, indicating, as predicted, that the marginal returns are less negative in the public sector than the private sector ($-0.641 + .152 = -0.489$). Figure 1c illustrates that the slope for public organizations is flatter than that for private organizations. This finding provides support for elaborating hypothesis 3 to indicate that diminishing returns have a clear impact that differs by sector; transformational leadership behaviors are subject to greater diminishing returns in the public sector while pecuniary reward behaviors diminish faster in the private sector.⁸ Even with the additional collinearity added in table 4, the basic findings of the previous analysis remain.

CONCLUSIONS

In contrast to the literature that contends leadership training should be equally effective in the public and private sectors, this field experiment showed that the effectiveness of transformational and transactional leadership training varied by sector. The differences were often subtle, but those differences were consistent with our theoretical expectations. Transformational leadership training by itself was effective only in the public sector; its impact on leadership behavior as seen by the employees in private sector organizations was limited. This impact held for both transformational leadership behaviors and the use of verbal appreciation. Combining transformational leadership training with transactional leadership training generated positive gains in transformational leadership behavior in both sectors; while the impact appeared larger in the public sector, the difference was not statistically significant. Unlike some of the literature that suggests combination training is more effective than just transformational or just transactional leadership training, we found no evidence that combined training outperformed

Sectoral Differences in Leadership Training Effectiveness

transformational training by itself on a consistent basis (the difference in the coefficients was never significant and in the right direction).

Transactional training by itself had no impact in increasing the use of verbal appreciation but it did increase the use of pecuniary rewards. These influences were not affected by sector, that is, there was no difference in transactional training impact across the sectors. When transactional training was combined with transformational training, however, its influence on the use of pecuniary rewards was limited to the public sector. In both transformational leadership and in the use of pecuniary rewards, we also found sector differences related to preexisting leadership levels. Higher levels of preexisting transformational leadership in the public sector generated greater diminishing marginal returns in the public sector compared to the private sector. Similarly, higher levels of pecuniary rewards in the private sector generated greater diminishing marginal returns than in the public sector.

Stepping back from the details of the experiment, leadership training appears to be more effective in the types of organizations (in this case different sectors) where the orientation of the training (or at least part of the training) is consistent with the existing reward structure of the sector. Transformational leadership training shows more promise in the public sector than the private sector. While transactional leadership training is generally equally effective in both sectors, its influence in the public sector is facilitated when it is combined with transformational leadership training. These direct effects of the training intervention also exist alongside differences in the marginal returns to training based on preexisting leadership behaviors. A topic for future research is to move to more nuanced classifications of organizations and their orientation toward different forms of leadership to determine if this is a sector specific finding or whether any organizations with a history of transformational leadership will be more responsive

to additional transformational leadership training (and similar questions about transactional leadership training).

Although our experiment is the largest field experiment in terms of number of leaders and the extent of training provided exceeded that of prior efforts, the study is not without limitations. First, practical fiscal constraints of field experiments limited this study to a small number of industries in a single country. The private sector organizations included in the study with one exception (banks) had very public purposes, and even the banks are strongly regulated by government. Leaders of organizations more exposed to market forces might well respond differently to leadership training. Similarly, the public organizations examined all have potential private sector counterparts (even tax agencies can be privatized, see Lowery 1982). Public organizations, particularly those without established performance criteria (e.g., foreign policy, defense), could also respond differently.

Second, the political and organizational context in Denmark might affect the results given the variation in other management variables across nations (O'Toole and Meier 2015). Denmark, given its corporatist political structure creates an environment where the distinction between public and private organizations is not as great as in liberal political systems such as the U.S or Australia. The corporatist context likely reduced the sectoral differences, and replications in more market oriented contexts should show larger differences. A comparison of Danish and US schools (Meier et al. 2015) shows that Danish schools are less hierarchical with less decision authority vested in management, both of which occur in the presence of strong unions. Such characteristics likely make the job of leadership more difficult and could affect the relative efficacy of transformational and transactional leadership training. Clearly similar studies in other nations and contexts would be valuable.

Third, while field experiments have advantages in terms of external validity, they operate without the rigid controls that are possible in a laboratory experiment. The current experiment operated amidst the day-to-day pressures that organizations face and fairly strong demands by owners and political principals for improved performance. Any concurrent policy or procedural changes that affected these organizations cannot be fully disentangled from the experimental treatment effect.

Finally, this study has not addressed the efficiency question but solely the effectiveness of leadership training. Whether the degree of change induced by the experiment is sufficient to change the performance of the organization and whether the costs of training justify the end results are topics for future research. The subsequent impact of leadership training on organizational effectiveness remains an important question and one that needs to be addressed in a variety of contexts.

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Sectoral Differences in Leadership Training Effectiveness

Table 1. The Impact of Transformational Leadership Training on Employee Perceptions of Transformational Leadership

DV: Δ Transformational Leadership	Model 1	Model 2	Model 3
Transformational Leadership Training	4.206** (1.496)	4.381** (1.475)	-3.848 (2.661)
Combined Leadership Training	4.228** (1.284)	4.195** (1.292)	2.275 (2.931)
Public Organization (Public=1)		3.316** (1.239)	-1.884 (2.035)
Public \times Transformational			7.937* (3.164)
Public \times Combined Training			2.668 (3.302)
High Absences (1=two or more absences)			-2.088 (1.595)
Transformational Leadership _t			-0.408** (0.027)
Constant	-2.833** (1.002)	-5.762** (1.321)	28.119** (2.766)
R-Squared overall	0.0102	0.0135	0.2144
N	2446	2446	2446

Notes: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$; clustered robust standard errors in parentheses; two-tailed test.

Sectoral Differences in Leadership Training Effectiveness

Table 2. Impact of Training on the Employee Perceived Use of Verbal Appreciation

DV: Δ the Use of Verbal Appreciation	Model 1	Model 2	Model 3
Transformational Leadership Training	1.163 (1.521)	1.267 (1.503)	-6.029 (3.925)
Combined Leadership Training	1.340 (1.491)	1.321 (1.502)	-0.973 (3.053)
Transactional Leadership Training	2.168 (1.377)	2.232 (1.374)	-0.754 (2.920)
Public Organization (Public=1)		1.920 (1.480)	-4.160 (2.557)
Public \times Transformational			7.475+ (4.250)
Public \times Combined Training			2.150 (3.502)
Public \times Transactional			3.040 (3.316)
High Absences (1=two or more absences)			-1.846 (1.708)
Verbal Appreciation _t			-0.371** (0.020)
Constant	-1.690+ (0.945)	-3.386* (1.517)	27.055** (2.822)
R-Squared overall	0.0011	0.0020	0.1785
N	3163	3163	3163

Notes: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$; clustered robust standard errors in parentheses; two-tailed test.

Sectoral Differences in Leadership Training Effectiveness

Table 3. The Impact of Transactional Leadership Training on Employee Perceived Use of Pecuniary Rewards

DV: Δ the Use of Pecuniary Rewards	Model 1	Model 2	Model 3
Transactional Leadership Training	2.928* (1.475)	2.974* (1.475)	3.872 (3.753)
Combined Leadership Training	2.301 (1.446)	2.286 (1.452)	-2.758 (3.530)
Public Organizations (Public=1)		1.405 (1.902)	-0.705 (2.596)
Public \times Transactional			0.658 (4.086)
Public \times Combined Training			6.611+ (3.956)
High Absences (1=two or more absences)			-6.127** (1.718)
Pecuniary Rewards _t			-0.508** (0.022)
Constant	-2.190* (0.936)	-3.429+ (1.848)	17.912** (2.458)
R-Squared overall	0.0027	0.0031	0.2470
N	2304	2304	2304

Notes: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$; clustered robust standard errors in parentheses; two-tailed test.

Sectoral Differences in Leadership Training Effectiveness

Table 4. Testing Differences in Marginal Returns for Prior Leadership behaviors

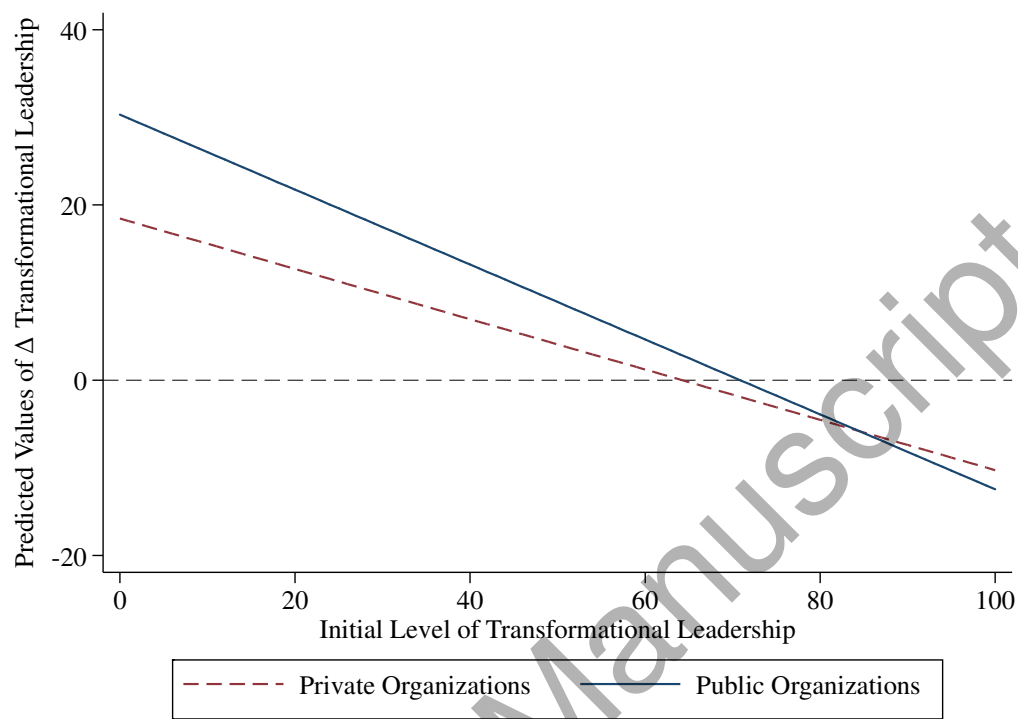
Dependent Variables:	Δ TFL	Δ VR	Δ PR
	Model 1	Model 2	Model 3
Public Organizations (Public=1)	9.058+	0.268	-6.430+
	(5.256)	(4.491)	(3.672)
Transformational Leadership Training	-2.473	-5.375	
	(2.282)	(3.854)	
Public \times Transformational	6.452*	6.795	
	(2.776)	(4.187)	
Combined Leadership Training	3.076	-0.431	-3.093
	(2.511)	(3.054)	(3.595)
Public \times Combined Training	1.862	1.596	6.954+
	(2.923)	(3.484)	(4.009)
Transactional Leadership Training		-0.445	4.062
		(2.829)	(4.053)
Public \times Transactional		2.725	0.429
		(3.243)	(4.357)
Transformational Leadership _t	-0.287**		
	(0.056)		
Public \times Transformational _t	-0.141*		
	(0.063)		
Verbal Appreciation _t		-0.323**	
		(0.036)	
Public \times Verbal Appreciation _t		-0.057	
		(0.043)	
Pecuniary Rewards _t			-0.641**
			(0.068)
Public \times Pecuniary Rewards _t			0.152*
			(0.072)
High Absences (1=two or more absences)	-1.933	-1.808	-6.193**
	(1.592)	(1.717)	(1.692)
Constant	18.568**	23.166**	22.898**
	(4.774)	(4.004)	(3.442)
R-Squared overall	0.2173	0.1791	0.2495
N	2446	3163	2304

Notes: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$; Δ TFL= change in transformational leadership; Δ VR=change in the use of verbal appreciation; Δ PR=change in the use of pecuniary rewards; clustered robust standard errors in parentheses; two-tailed test.

Sectoral Differences in Leadership Training Effectiveness

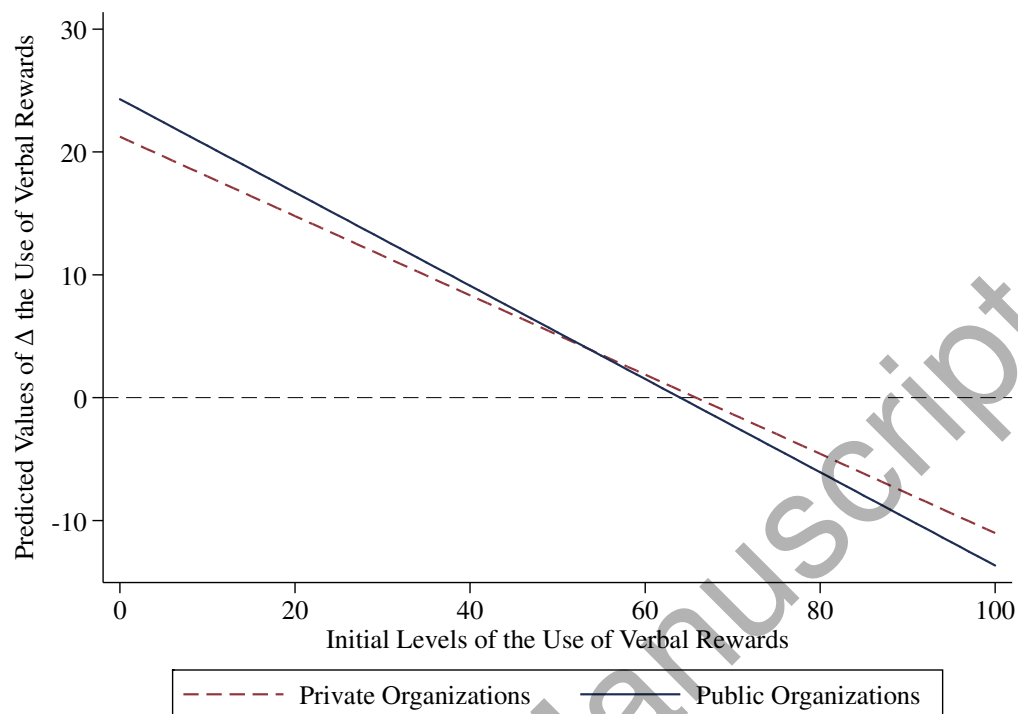
Figures

Figure 1a: Diminishing marginal returns in public and private organizations (transformational leadership):
The impact of training declines if prior levels of leadership are high



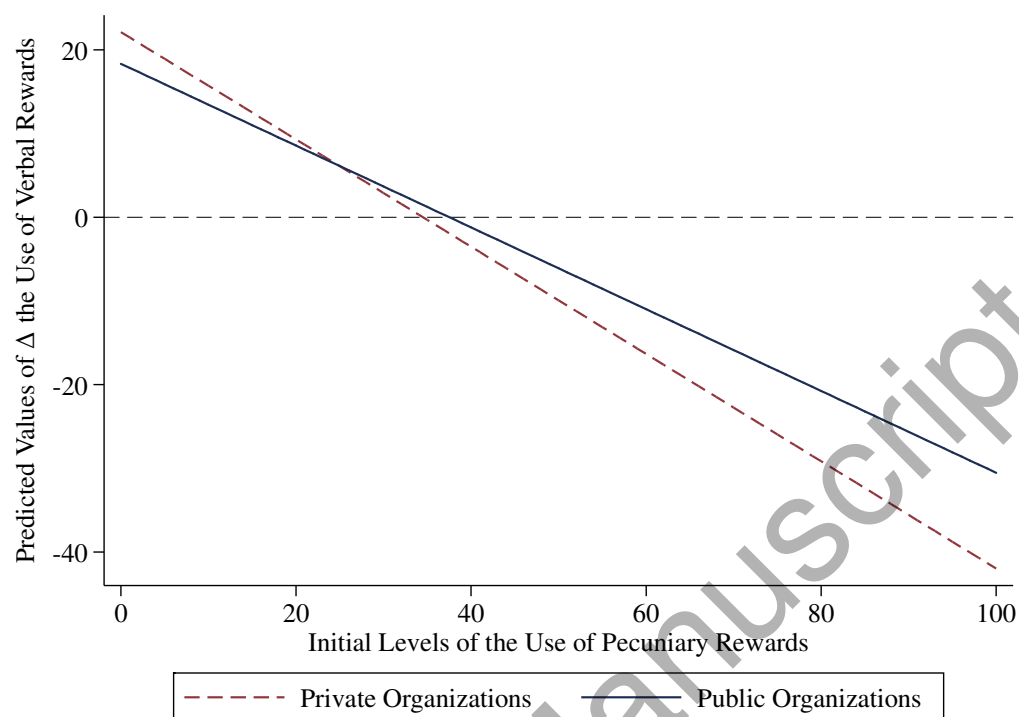
Sectoral Differences in Leadership Training Effectiveness

Figure 1b: Diminishing marginal returns in public and private organizations (the use of verbal rewards):
The impact of training declines if prior use of verbal rewards is high



Sectoral Differences in Leadership Training Effectiveness

Figure 1c: Diminishing marginal returns in public and private organizations (the use of pecuniary rewards): The impact of training is lower if prior use of pecuniary rewards is higher



Sectoral Differences in Leadership Training Effectiveness

Appendix

Table 1: Factor Loadings for each indicator

Transformational Leadership Indicators	Loading
Concretizes a clear vision for the [organization's] future	0.86
Seeks to make employees accept common goals for the [organization]	0.84
Strives to get the [organization's] employees to work together in the direction of the vision	0.90
Strives to clarify for the employees how they can contribute to achieving the [organization's] goals	0.88
Cronbach's alpha=0.89	
Verbal Appreciation Indicators	Loading
Gives individual employees positive feedback when they perform well	0.94
Actively shows his/her appreciation of employees who do their jobs better than expected	0.93
Personally compliments employees when they do outstanding work	0.95
Cronbach's alpha=0.93	
Pecuniary Rewards Indicators	Loading
Rewards the employees' performance when they live up to his/her requirements	0.92
Rewards the employees' dependent on how well they perform their jobs	0.90
Points out what employees will receive if they do what is required	0.84
Cronbach's alpha=0.88	

Table 2: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Δ Transformational Leadership	2446	.05	19.42	-100	100
Transformational Leadership _i	2446	70.05	21.42	0	100
Δ Verbal Appreciation	3163	-.52	22.63	-100	100
Verbal Appreciation _i	3163	65.61	25.80	0	100
Δ Pecuniary Rewards	2304	-.44	23.91	-100	100
Pecuniary Rewards _i	2304	38.03	22.99	0	100
Transformational Leadership Training	3207	.25	.43	0	1
Combined Leadership Training	3207	.26	.44	0	1
Transactional Leadership Training	3207	.23	.42	0	1
Public Organizations (Public=1)	3207	.86	.34	0	1
High Absences (1=two or more absences)	3207	.18	.39	0	1

NOTES

¹ This demonstrated effectiveness is the key reason our experimental study focuses on transformational and transactional leadership rather than other types of leadership.

² A group of upper secondary school principals also participated in the study, but these were all from public schools. Because there were no private sector comparisons for this group, they are not included in the analysis. Only managers with direct responsibility for employees without leadership responsibilities are included (excluding day care leaders of other day care leaders).

³ The numbers in the tables will vary from this because in some cases the experimental groups not relevant to the hypothesis (that is the transactional training group in the transformational behavior results) will not be included. There are also a modest number of missing cases.

⁴ The relationship between absences and the impact of training is not strictly linear. There is a negative impact (that is, less effective training) when there are two or more absences.

⁵ Only those employees who answered both pre and post surveys are included in the analysis.

Approximately 20% of employees did not fill out of the post survey; in some cases these individuals were no longer working for the organization. The individuals who only filled out the pre-survey were more negative in their assessments of leadership, but the standard deviations were similar. The use of only employees who filled out both surveys, therefore, might under estimate the impact of leadership training.

⁶ This relationship is not strictly linear with small quadratic coefficients also statistically significant. This nonlinearity indicates that the relationship itself has diminishing marginal returns. We will address this in terms of sector differences in the analysis in Table 4.

⁷ The average variance inflation scores for model 1, model 2, and model 3 are 11.04, 10.94, and 8.80 respectively. These indicate substantial collinearity, but the effects remain statistically significant.

⁸ The diminishing returns findings reflect clear differences in the slopes. They are not the result of differences in the pretraining values for transformational leadership and for pecuniary rewards.